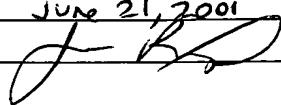


I hereby certify that this correspondence is being deposited with the United States Postal Service in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR §1.10, Mailing Label No. EF057860245US addressed to Commissioner for Patents, Washington, D.C. 20231 on

JUNE 21, 2001

By



PATENT

Attorney Docket No.: IMM1P070A.RE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re reissue application of:

Roston, *et al.*

Application No.: Unassigned

Filed: Unassigned

For: GYRO-STABILIZED PLATFORMS FOR  
FORCE-FEEDBACK APPLICATIONS

Commissioner for Patents  
Washington, D. C. 20231

Sir:

We, Gerald P. Roston and Charles J. Jacobus, state and declare the following:

Examiner: Unassigned

Art Unit: Unassigned

**REISSUE DECLARATION UNDER  
37 C.F.R. § 1.175(a) AND POWER OF  
ATTORNEY BY INVENTORS**

1. We are citizens of the United States of America residing at 442 Sydney Dr., Saline, MI, 48176, and 432 Riverview Dr., Ann Arbor, Michigan, 48104, respectively.

2. The entire right, title and interest to U.S. Patent No. 5,754,023, issued May 19, 1998, is vested in Cybernet Haptic Systems Corp., a wholly-owned subsidiary of Immersion Corp., a Delaware corporation having a regular and established place of business at 801 Fox Lane, San Jose, CA 95131.

3. We verily believe ourselves to be the original, first, and joint inventors of the invention described and claimed in the above-identified United States Letters

Patent and in the present continuation application for reissue of the above-identified United States Letter Patent.

4. We have reviewed and understand the contents of the attached specification and claims, including the new claims as presented in this continuation application for reissue of the original Letters Patent.

5. We acknowledge the duty to disclose information of which we are aware and which is material to the examination of this application for reissue of the original Letters Patent in accordance with 37 C.F.R. § 1.56, including information which was discovered between the filing date of United States Patent Application Serial No. 08/736,016 that matured into the Letters Patent for which reissue is being sought and the filing date of this application for reissue.

6. We verily believe that the original Letters Patent is partly or wholly inoperative or invalid by reason of our claiming more or less than we had a right to claim in the original Letters Patent, and that the errors described below which render said Letters Patent so partly or wholly inoperative or invalid occurred through inadvertence and/or omission without any fraudulent or deceptive intent on our part.

7. More specifically, we believe that the original Letters Patent for which we seek reissue claims more or less than we had the right to claim for the following reasons:

7.1. Column 4, lines 20-28, column 23, lines 3-50, and column 25, lines 33-35 and 53-65 of the original Letters Patent, among other description in said Patent, includes what we believe to be an accurate and proper characterization and embodiment of a spatially unrestricted force-feedback device, and is reproduced in part below:

According to the invention, programmed amounts of rotary force are used for motion compensating and/or the stabilization of free-flying platforms, or to provide force/torque outputs from platforms to attached frames. Specific embodiments are disclosed with respect to spacecraft stabilization, as well as to the application of forces and/or

torques to hand-held force generating devices, including joysticks, steering wheels, and implements of arbitrary shape for specific applications, such as sports simulations.

This test setup consists of the following components:

A turntable with an attached motor. The position of the turntable is instrumented with an incremental encoder attached directly to the turntable... The position of the motor shaft was not instrumented, however, its angular velocity is instrumented...

A momentum wheel attached to the motor shaft. This momentum wheel is manufactured from a piece of stock, 2 inch diameter, cast iron shaft.

The motor is attached to a CyberImpact® Intelligent Motor Controller (IMC) system, a standard Cybernet product and is used with all of our force feedback devices, which provides an interface to a PC based controller that allows for a wide range of motion commands to be programmed.

The IMC is attached to a PC. In this example, a simple, previously developed interface to start and stop the motor was employed...

A torque measuring system consisting of a spring and a camera. Applied torque was measured by the displacement of a known spring and the time for this to happen by counting video frames.

The position, velocity, and/or acceleration provided on a user-interactable member is sensed and transmitted as a command to a computer model or simulation which implements a virtual reality force field. In turn, the force field value for the given position, velocity, and/or acceleration is sent back to the member, which generates a force command, thereby providing the user with direct kinesthetic feedback

from the virtual environment traversed. Although applicable to controlling a virtual or simulated environment, the technology is also well suited to the control of a remote or physical device. Further, the present invention is suited for application to any number of axes.

The operation of the IMC system and PC interface will be best understood by referring to commonly assigned U.S. Pat. Nos. 5,389,865 and 5,459,382, and pending applications Ser. Nos. 08/513,488 and 08/543,606, the contents of each of which are incorporated herein in their entirety by reference.

...To perform this experiment, three motors with momentum wheels were mounted onto the adapter block used in the previous experiments...

Having demonstrated that forces can be generated in any direction, the final task is to control the motors in an appropriate manner so as to provide haptic feedback to the user...some subset of the motors will produce torques...that are undesired. To counteract these undesired torques, some subset of the motors will need to be accelerated to produce counter torques.

7.2. The absence in the original Letters Patent of an independent claim in which a spatially unrestricted force-feedback device includes a body, a plurality of motors capable of imparting an inertial force about an axis of rotation to provide tactile sensations on the body, a user-interactable member in communication with a host computer modeling a simulated environment and commanding the tactile sensations, and a computer mediated controller receiving signals from the host computer and controlling the motors, such as is provided in new claim 25 below, resulted in the original Letters Patent claiming less than the applicant had a right to claim. At the time of drafting and prosecution of the application that matured into the original Letters Patent, we did not perceive that such a claim could be made. We recently reviewed the claims of the original Letters Patent and realized that there was an issue that we may have claimed less than we had a right to claim, and we have

been consulting with our counsel to determine whether a reissue should be filed to cure this error.

7.3. To cure the aforementioned error of inadvertent omission, we therefore request the addition of a claim such as claim 25 below:

25. A spatially unrestricted force-feedback device, comprising:  
a body;

a plurality of motors, each of said motors capable of imparting an inertial force about an associated axis of rotation and each of said motors connected to said body to provide computer controllable tactile sensations on said body about said associated axis;

a user-interactable member connected to said body, wherein said user-interactable member is in communication with a host computer system modeling a simulated environment including one or more simulated objects, said host computer system commanding said tactile sensations on said body as a function of a simulated activity involving at least one object within said simulated environment; and

a computer mediated controller electrically connected to said motors and in communication with said host computer system, said controller receiving signals from said host computer system and simultaneously controlling each of said motors in response such that said motors produce said inertial forces about said axes, and said controller sending data to said host computer system, said data responsive to user manipulation of said user-interactable member.

7.4. The addition of such a claim would cure our error of inadvertent omission by reciting a force-feedback device that includes multiple motors having spinning momentum masses, a user-interactable member, and a computer mediated controller, without the inclusion of elements which are not required to distinguish the invention over the prior art. In particular, this claim differs from the independent claims of the present Letters Patent by reciting, among other elements, "a plurality of motors, each of said motors capable of spinning a momentum mass about an associated axis of rotation and each of said motors connected to said body to provide computer controllable tactile sensations on said body about said associated axis" and "a computer mediated controller" for receiving signals from the host computer system and controlling motors and sending data to the host computer system, the data

responsive to user manipulation of said user-interactable member, without the inclusion of other elements such as gyroscopic means to provide an inertial reference, or an active control system to stabilize the body in space, which are now understood not to be required to distinguish the invention recited in claim 25.

7.5. New dependent claims 26 and 27 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that the computer mediated controller decodes commands received from the host computer system, and on a serial communication bus.

7.6. New dependent claim 28 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that the user-interactable member is a joystick.

7.7. New dependent claim 29 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that the user-interactable member is a steering wheel.

7.8. New dependent claim 30 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that the user-interactable member is associated with the simulation of a sport.

7.9. New dependent claims 31 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that the computer mediated controller includes a processor that runs motor control code stored in Read-Only memory.

7.10. New dependent claim 32 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that at least a portion of said computer controllable inertial forces stabilize said body in at least one spatial dimension to counteract undesired torques produced by at least one of said motors.

7.11. New dependent claim 33 would cure the inadvertent omission of a claim dependent on claim 25 and which recites that said computer controllable inertial forces stabilize said body in at least one spatial dimension.

7.12. We hereby appoint the following attorneys and agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

James R. Riegel, Reg. No. 36,651; Guy V. Tucker, Reg. No. 45,302.

8. Please send all correspondence to:

James Riegel  
IMMERSION CORPORATION  
801 Fox Lane  
San Jose, CA 95131

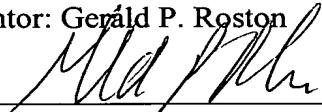
Please direct all telephone calls to:

James R. Riegel, Registration No. 36,651

Tel: (408) 467-1900; Fax: (408) 467-1901

9. We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Full name of first inventor: Gerald P. Roston

Inventor's signature: 

Date: 7 JUNE 2001

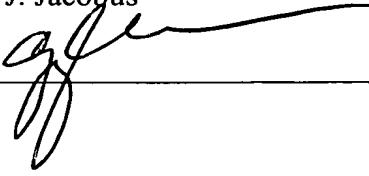
Country of Citizenship: USA

Residence: 442 Sydney Dr.

Saline, MI 48176

Post Office Address: Same.

Full name of co-inventor: Charles J. Jacobus

Inventor's signature: 

Date: 5/9/01.

Country of Citizenship: USA

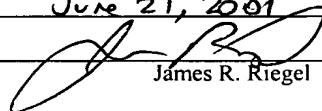
Residence: 432 Riverview Dr.

Ann Arbor, MI 48104

Post Office Address: Same.

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail Post Office to Addressee, Mailing Label No. EF057860245US, addressed to: Commissioner for Patents, Washington, D.C. 20231 on June 21, 2001.

By



James R. Riegel

PATENT

Attorney Docket No.: IMM1P070A.RE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re reissue application of:

**ROSTON *et al.***

Application No.: Unassigned

Filed: June 18, 2001

For: **GYRO-STABILIZED PLATFORMS FOR  
FORCE-FEEDBACK APPLICATIONS**

Examiner: Unassigned

Art Unit: Unassigned

**WRITTEN CONSENT OF  
ASSIGNEE AND STATEMENT  
UNDER 37 CFR § 3.73(B)**

Commissioner of Patents and Trademarks  
Washington, D. C. 20231

Sir:

This is part of the application for a reissue patent based on original U.S. Patent No. 5,754,023. The assignee(s) owning an undivided interest in said original patent is Cybernet Haptic Systems Corporation, a Michigan corporation which is a wholly-owned subsidiary of Immersion Corporation. The assignee consents to the accompanying continuation application for reissue. Assignee hereby assents to the Declaration executed by the inventors and included herewith. A Statement Under 37 C.F.R. § 3.73(b) is submitted herewith.

Cybernet Haptic Systems Corporation

Date: 6-21-01

By: Victor Viegas

Name: Victor Viegas

Title: Vice President, Finance and  
Chief Financial Officer

*Statement Under 37 C.F.R. § 3.73(b)*

The assignee of the above-identified application for reissue, Cybernet Haptic Systems Corporation, a Michigan corporation, states that it is the Assignee of the entire right, title, and interest in the present continuation application for reissue by virtue of the Assignment of U.S. Patent No. 5,754,023 from the inventors to Cybernet Haptic Systems Corporation, which is a wholly-owned subsidiary of Immersion Corporation, the assignment being recorded in the U.S. Patent and Trademark Office at Reel No. <sup>009570</sup> 0037, Frame No.        (copy attached). A document demonstrating the ownership of Cybernet Haptic Systems Corporation by Immersion Corporation is also attached.

The undersigned (whose title is supplied below) is empowered to sign this statement on behalf of the Assignee.

Cybernet Haptic Systems Corporation

Date: 6-21-01

By: *Victor Viegas*

Name: Victor Viegas

Title: Vice President, Finance and  
Chief Financial Officer

## ASSIGNMENT OF PATENT

Whereas I/we the undersigned inventor(s) have invented certain new and useful improvements as set forth in the patent entitled:

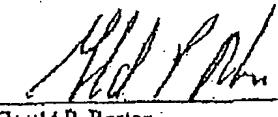
### GYRO-STABILIZED PLATFORMS FOR FORCE-FEEDBACK APPLICATIONS

for which I (we) have executed an application for a United States Letters Patent which was filed in the U.S. Patent and Trademark Office on October 22, 1996, and which bears the Patent No. 5,754,023.

For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I/We the undersigned inventor(s) hereby:

- 1) Sell(s), assign(s) and transfer(s) to Cybernet Haptic Systems Corporation, a Michigan corporation having a place of business at 2158 Paragon Dr., San Jose, CA, 95131 (hereinafter referred to as ("ASSIGNEE")); the entire right title and interest in any and all improvements and inventions disclosed in, application(s) based upon, and Patent(s) (including foreign patents) granted upon the information which is disclosed in the above referenced application.
- 2) Authorize and request the Commissioner of Patents to issue any and all Letters Patents resulting from said application or any division(s), continuation(s), substitutes(s) or reissue(s) thereof to the ASSIGNEE.
- 3) Agree to execute all papers and documents and, entirely at the ASSIGNEE's expense, perform any acts which are reasonably necessary in connection with the prosecution of said application, as well as any derivative and applications thereof, foreign applications based thereon, and/or the enforcement of patents resulting from such applications.
- 4) Agree that the terms, covenants and conditions of this assignment shall inure to the benefit of the Assignee, its successors, assigns and other legal representative, and shall be binding upon the inventor(s), as well as the inventor's heirs, legal representatives and assigns.
- 5) Warrant and represent that I/we have not entered, and will not enter into any assignment, contract, or understanding that conflicts with this assignment.

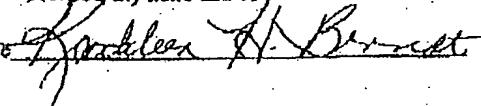
Signed on the date(s) indicated beside my (our) signature(s).

1) Signature:   
Typed Name: Gerald P. Roston

Date: 4 NOVEMBER 1999

On this 4<sup>th</sup> day of November, in the year 1999, before me, Gerald P. Roston, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he/she executed the same in his/her authorized capacity(ies), and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature 

(SEAL)

MY COMMISSION EXPIRES

APRIL 23, 2004

2) Signature: Charles J. Jacobs  
Typed Name: Charles J. Jacobs

Date: 11/12/99

On this 12<sup>th</sup> day of November, in the year 1999, before me, Charles J. Jacobus, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument, and acknowledged to me that he/she executed the same in his/her authorized capacity(ies), and that by his/her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

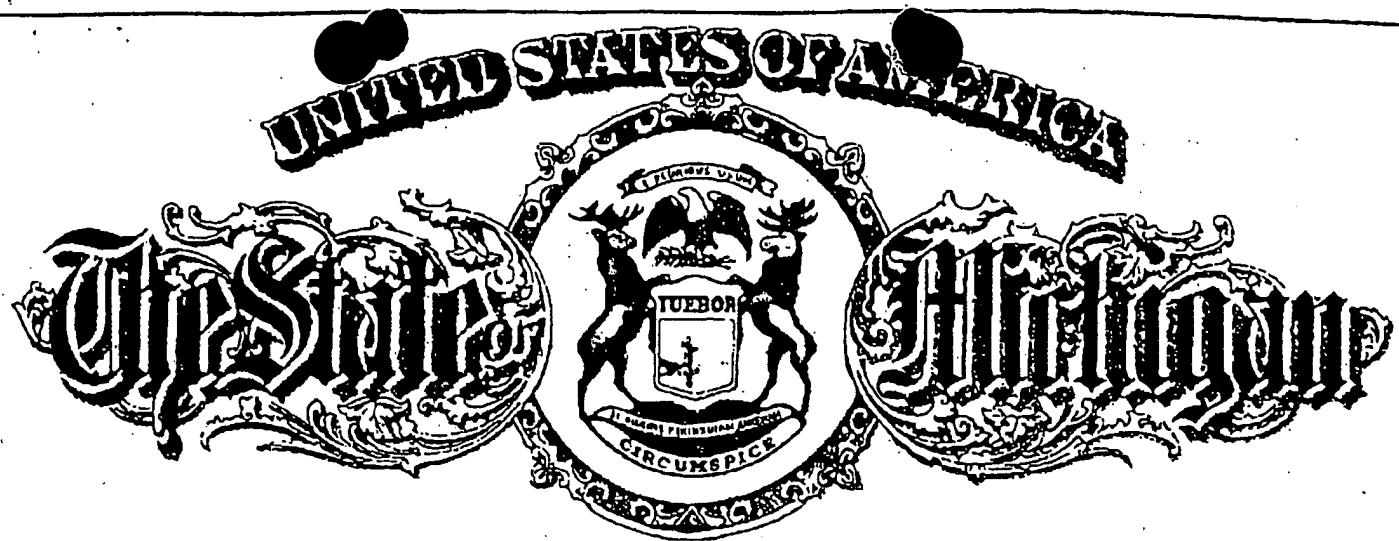
WITNESS my hand and official seal.

WITNESS my hand and official seal.

(SEAL)

BRENT W. ROYAL  
Notary Public, Washtenaw County, MI  
My commission expires 10-23-2001

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Michigan Department of Consumer and Industry Services

Lansing, Michigan

This is to Certify that the Annexed copy has been compared by me with the record on file in this Department and that the same is a true copy thereof.

In testimony whereof, I have hereunto set my hand and affixed the Seal of the Department, in the City of Lansing, this 5th day of March, 1999.

*Julie Croll*

Director

Corporation, Securities and Land Development Bureau

172

GOLD SEAL APPEARS ONLY ON ORIGINAL

5501  
MICHIGAN DEPARTMENT OF CONSUMER AND INDUSTRY SERVICES  
CORPORATION, SECURITIES AND LAND DEVELOPMENT BUREAU

Date Received

MAR 05 1999

(FOR BUREAU USE ONLY)

This document is effective on the date filed, unless a subsequent effective date within 90 days after received date is stated in the document

FILED

MAR 05 1999

Name

Address

City

State

Zip Code

Administrator  
CORP., SECURITIES & LAND DEV. BUREAU

## EFFECTIVE DATE:

Expiration date for new assumed names: December 31,

Expiration date for transferred assumed names appear in  
Item 6Document will be returned to the name and address you enter above.  
If left blank, document will be mailed to the registered office.

## CERTIFICATE OF MERGER

Cross Entity Merger for use by Profit Corporations, Limited Liability Companies  
and Limited PartnershipsPursuant to the provisions of Act 284, Public Acts of 1972 (profit corporations), Act 23, Public Acts of 1993  
(limited liability companies) and Act 213, Public Acts of 1981 (limited partnerships), the undersigned entities execute the  
following Certificate of Merger:

## 1. The Plan of Merger (Consolidation) is as follows:

## a. The name of each constituent entity and its identification number is:

Cybernet Haptic Systems Corporation

06527A

Immersion Acquisition Corporation

## b. The name of the surviving (new) entity and its identification number is:

Cybernet Haptic Systems Corporation

06527A

Corporations and Limited Liability Companies provide the street address of the survivor's principal place of business:

2. (Complete only if an effective date is desired other than the date of filing. The date must be no more than 90 days after the  
receipt of this document in this office.)

The merger (consolidation) shall be effective on the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_.

12500 SEASAPPEARS ONLY ON ORIGINAL \$62.50 CK TAK 78600

## 3. Complete for Profit Corporations only

For each constituent stock corporation, state:

Name of corporation	Designation and number of outstanding shares in each class or series	Indicate class or series of shares entitled to vote	Indicate class or series entitled to vote as a class
Immersion Acquisition Corporation	10,000 - Common Stock	Common Stock	Common Stock
Cybernet Haptic Systems Corporation	10,000 - Common Stock	Common Stock	Common Stock

If the number of shares is subject to change prior to the effective date of the merger or consolidation, the manner in which the change may occur is as follows:

The manner and basis of converting shares are as follows: Each issued and outstanding share of Immersion Acquisition Corporation (the "Terminating Corporation") shall, upon the effective date of the merger be converted into and become one fully paid and nonassessable share of common stock of Cybernet Haptic Systems Corporation (the "Surviving Corporation"). Each issued and outstanding share of the Surviving Corporation shall be converted into the right to receive 160 fully paid and nonassessable shares of common stock of Immersion Corporation.

The amendments to the Articles, or a restatement of the Articles, of the surviving corporation to be effected by the merger are as follows: The Articles of Incorporation of the Surviving Corporation upon the effective date of the merger in the state of Michigan shall continue to be the Articles of Incorporation of the Surviving Corporation and shall continue in full force and effect until amended and changed in the manner prescribed by the provisions of the Business Corporation Act of the State of Michigan. The bylaws of the Surviving Corporation as in force and effect upon the effective date of the merger in the State of Michigan shall continue to be the bylaws of the Surviving Corporation and shall continue in full force and effect until changed, altered or amended as therein provided and in the manner prescribed by the provisions of the Business Corporation Act of the State of Michigan.

The Plan of Merger will be furnished by the Surviving Corporation, on request and without cost, to any shareholder of any constituent profit corporation.

The merger is permitted by the state under whose law it is incorporated and each foreign corporation has complied with that law in effecting the merger.

(Complete either Section (a) or (b) for each corporation)

a. The Plan of Merger was approved by the majority consent of the incorporators of \_\_\_\_\_, a Michigan corporation which has not commenced business, has not issued any shares, and has not elected a Board of Directors.

(Signature of Incorporator) (Type or Print Name)

b. The plan of merger was approved by:  
 the Board of Directors of \_\_\_\_\_, the surviving Michigan corporation, without approval of the shareholders in accordance with Section 703a of the Act.

② the Board of Directors and the shareholders of the following Michigan corporation(s) in accordance with Section 703a of the Act:

## Cybernet Handic Systems Corporation

By: John Doe  
(Signature of Authorized Officer or Agent)

~~(Signature of Authorized Officer or Agent)~~

Charles J. Jacobus  
(Type or print name)

By: \_\_\_\_\_  
(Signature of Authorized Officer or Agent)

(Signature of Authorized Officer or Agent)

Cybernet Haptic Systems Corporation  
(Name of Corporation)

Immerse Acquisition Corporation  
(Type of Corporation)

**GOLD SEAL APPEARS ONLY ON ORIGINAL**

State of Delaware

PAGE 1

## Office of the Secretary of State

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF MERGER, WHICH MERGES:

"IMMERSION ACQUISITION CORPORATION", A DELAWARE CORPORATION, WITH AND INTO "CYBERNET HAPTIC SYSTEMS CORPORATION" UNDER THE NAME OF "CYBERNET HAPTIC SYSTEMS CORPORATION", A CORPORATION ORGANIZED AND EXISTING UNDER THE LAWS OF THE STATE OF MICHIGAN, AS RECEIVED AND FILED IN THIS OFFICE THE FOURTH DAY OF MARCH, A.D. 1999, AT 4 O'CLOCK P.M.

A FILED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE KENT COUNTY RECORDER OF DEEDS.

3012642 8100M  
991085467



*Edward J. Freel*  
Edward J. Freel, Secretary of State

AUTHENTICATION: 9613096  
DATE: 03-05-99

STATE OF DELAWARE  
SECRETARY OF STATE  
DIVISION OF CORPORATIONS  
FILED 04:00 PM 03/04/1999  
991085067 - 3011495

CERTIFICATE OF MERGER  
OF  
IMMERSION ACQUISITION CORPORATION  
(a Delaware corporation)  
INTO  
CYBERNET HAPTIC SYSTEMS CORPORATION  
(a Michigan corporation)

Cybernet Haptic Systems Corporation does hereby certify:

First: That the name and state of incorporation of each of the constituent corporations of the merger is as follows:

Name	State of Incorporation
Immersion Acquisition Corporation	Delaware
Cybernet Haptic Systems Corporation	Michigan

Second: That an Agreement and Plan of Reorganization dated as of March 4, 1999, by and among Immersion Corporation, Immersion Acquisition Corporation, Cybernet Systems Corporation and Cybernet Haptic Systems Corporation has been approved, adopted, certified, executed and acknowledged by each of the constituent corporations in accordance with the requirements of Section 252 of the General Corporation Law of the State of Delaware.

Third: That the name of the surviving corporation of the merger is Cybernet Haptic Systems Corporation (the "Surviving Corporation").

Fourth: That the Certificate of Incorporation of Cybernet Haptic Systems Corporation shall, as of the effective time of the merger, be the Certificate of Incorporation of the Surviving Corporation.

Fifth: That the executed Agreement and Plan of Reorganization is on file at the principal place of business of the Surviving Corporation. The address of said principal place of business is 2158 Paragon Drive, San Jose, CA 95131.

Sixth: That a copy of the Agreement and Plan of Reorganization will be furnished by the Surviving Corporation upon request and without charge to any stockholder of any constituent corporation.

Seventh: Cybernet Haptic Systems Corporation hereby agrees that it may be served with process in Delaware in any proceeding for enforcement of any obligation of Immersion Acquisition Corporation arising from the merger, including any suit or other proceeding to enforce the right of any stockholder as determined in appraisal proceedings pursuant to 8 Del.C. § 262, and Cybernet Haptic Systems Corporation hereby irrevocably appoints the Secretary of State of the State of Delaware as its agent to accept service of process in any such suit or other proceeding and a copy of such process shall be mailed by the Secretary of State to the principal place of business of Cybernet Haptic Systems Corporation at 2158 Paragon Drive, San Jose, CA 95131, Attention: President.

**Eighth:** That this Certificate of Merger shall be effective upon the acceptance of the Certificate of Merger of Immersion Acquisition Corporation into Cybernet Haptic Systems Corporation .

IN WITNESS WHEREOF, the undersigned has caused this Certificate to be executed by its  
duly authorized officer this 4th day of March, 1999.

**CYBERNET HAPTIC SYSTEMS CORPORATION**  
(a Michigan corporation)

By: Charles J. Jacobus  
President

ପାତ୍ରାବ୍ଦୀ